WHAT IS CLAIMED IS:

1. An isolated CDK4 binding peptide comprising:
Tyr–Ser–Gly–Pro–Pro–Xaa_1–Xaa_2–Xaa_3–Arg–Arg–Xaa_4–Asn–Xaa_5–Tyr–Xaa_6 wherein Xaa_1= Cys or Ser; Xaa_2= Ser or Gly; Xaa_3= Ser, Ala or Pro; Xaa_4=Arg or Gln; Xaa_5= Ser, Cys or Gly; and Xaa_6=Asp or Glu.

2. The isolated CDK4 binding peptide, wherein the isolated peptide does not include a bHLH domain.

3. A fusion protein comprising:
(a) a CDK4 binding peptide comprising Tyr–Ser–Gly–Pro–Pro–Xaa_1–Xaa_2–Xaa_3–Arg–Arg–Xaa_4–Asn–Xaa_5–Tyr–Xaa_6 wherein Xaa_1= Cys or Ser; Xaa_2= Ser or Gly; Xaa_3= Ser, Ala or Pro; Xaa_4=Arg or Gln; Xaa_5= Ser, Cys or Gly; and Xaa_6=Asp or Glu; and
(b) a heterologous amino acid sequence.

4. The fusion protein of claim 3 wherein the heterologous amino acid sequence comprises a nuclear localization signal.

5. The fusion protein of claim 4 wherein the CDK4 binding peptide is at the C–terminus of the fusion protein.

6. A nucleotide sequence encoding a CDK4 binding peptide, wherein the CDK4 binding peptide comprises:
Tyr–Ser–Gly–Pro–Pro–Xaa_1–Xaa_2–Xaa_3–Arg–Arg–Xaa_4–Asn–Xaa_5–Tyr–Xaa_6 wherein Xaa_1= Cys or Ser; Xaa_2= Ser or Gly; Xaa_3= Ser, Ala or Pro; Xaa_4=Arg or Gln; Xaa_5= Ser, Cys or Gly; and Xaa_6=Asp or Glu.

7. The nucleotide sequence of claim 6, wherein the nucleotide sequence is a DNA sequence.

8. A method of inhibiting cell growth, comprising:
administering to a patient a CDK4 binding peptide comprising:
Tyr–Ser–Gly–Pro–Pro–Xaa_1–Xaa_2–Xaa_3–Arg–Arg–Xaa_4–Asn–Xaa_5–Tyr–Xaa_6

wherein Xaa_1= Cys or Ser; Xaa_2= Ser or Gly; Xaa_3= Ser, Ala or Pro; Xaa_4=Arg or Gln; Xaa_5= Ser, Cys or Gly; and Xaa_6=Asp or Glu in an amount effective to inhibit cell growth.

9. A method of inhibiting the activity of CDK4 comprising:

contacting CDK4 with a CDK4 binding peptide comprising:

Tyr–Ser–Gly–Pro–Pro–Xaa_1–Xaa_2–Xaa_3–Arg–Arg–Xaa_4–Asn–Xaa_5–Tyr–Xaa_6

wherein Xaa_1= Cys or Ser; Xaa_2= Ser or Gly; Xaa_3= Ser, Ala or Pro; Xaa_4=Arg or Gln; Xaa_5= Ser, Cys or Gly; and Xaa_6=Asp or Glu in an amount effective to inhibit the activity of CDK4.